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Appendix J: Sediment Transport Analysis

Coastal Virginia Offshore Wind Commercial Project

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The assessment presented herein is consistent with the Project Design Envelope considered by Dominion Energy Virginia (Dominion Energy) prior to summer 2022. Due to maturation of the Coastal Virginia Offshore Wind Commercial Project (Project) design, Dominion Energy was able to refine several components of the Project and has subsequently revised the Construction and Operations Plan (COP) as re-submitted in February 2023. The primary changes are summarized as follows:

- The Maximum Layout includes up to 202 wind turbine generators (WTGs), with a maximum WTG capacity of 16 megawatts. As the Preferred Layout, Dominion Energy proposes to install a total of 176, 14.7-megawatt capacity WTGs with 7 additional positions identified as spare WTG locations. For both the Preferred Layout and Maximum Layout, the Offshore Substations will be within the WTG grid pattern oriented at 35 degrees and spaced approximately 0.75 nautical mile (1.39 kilometers) in an east-west direction and 0.93 nautical mile (1.72 kilometers) in a north-south direction.
- Removal of Interconnection Cable Route Options 2, 3, 4, and 5 from consideration. As the Preferred Interconnection Cable Route Option, Dominion Energy proposes to install Interconnection Cable Route Option 1.

The analysis presented in this appendix reflects the initial 205 WTG position layout as well as Interconnection Cable Route Options 1, 2, 3, 4, 5, and 6 as the maximum Project Design Envelope. Reduction in the Project Design Envelope is not anticipated to result in any additional impacts not previously considered in the COP. Therefore, in accordance with the Bureau of Ocean Energy Management's Draft Guidance Regarding the Use of a Project Design Envelope in a Construction and Operations Plan (2018), the appendix has not been revised. Additional details regarding evolution of the Project is provided in Section 2 of the COP and details regarding the full Project Design Envelope are provided in Section 3 of the COP.

APPENDIX J SEDIMENT TRANSPORT ANALYSIS

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ACRONYMS AND ABBREVIATIONS

BOEM	Bureau Of Ocean Energy Management
cm	centimeter
CVOW	Coastal Virginia Offshore Wind
Dominion Energy	Virginia Electric And Power Company D/B/A Dominion Energy Virginia
ESPreSSO	Experimental System for Predicting Shelf and Slope Optics
ft	feet
ft/s	feet per second
HYCOM	Hybrid Coordinate Ocean Model
in	inch
km	kilometer
Lease Area	Outer Continental Shelf (OCS) Offshore Virginia (Lease No. OCS-A-0483)
m	meter
m/s	meters per second
mg/L	milligrams per liter
MOCHA	Mid-Atlantic Ocean Climatological Hydrographic Analysis
nm	nautical mile
OCS	Outer Continental Shelf
PDE	Project Design Envelope
Project	Coastal Virginia Offshore Wind Commercial
Project Area	Offshore Export Cable Route Corridor
ROMS	Regional Ocean Modeling System
Tetra Tech	Tetra Tech, Inc.
USGS	U.S. Geological Survey

J.1 INTRODUCTION

Tetra Tech, Inc. (Tetra Tech) was contracted by Virginia Electric and Power Company, doing business as Dominion Energy Virginia (hereafter referred to as Dominion Energy), to evaluate the potential suspended sediment transport and deposition associated with Coastal Virginia Offshore Wind (CVOW) Commercial Project (hereafter referred to as the Project) construction activities, including the installation of Offshore Export and Inter-Array Cables. The Project will be located in the Commercial Lease of Submerged Lands for Renewable Energy Development on the Outer Continental Shelf (OCS) Offshore Virginia (Lease No. OCS-A-0483) (Lease Area), which was awarded through the Bureau of Ocean Energy Management (BOEM) competitive renewable energy lease auction of the Wind Energy Area offshore of Virginia in 2013.

Disturbance of sediments during Project construction has the potential to affect water quality through increases to total suspended solids into the water column and deposition of sediments away from the location of sediment disturbance, including potentially outside the Offshore Project Area (defined as the Lease Area and Offshore Export Cable Route Corridor) through resuspension, dispersal, and subsequent sedimentation.

To provide a conservative estimate of potential maximum suspended sediment transport and deposition impacts, publicly available water circulation data and site-specific sediment data covering the Offshore Project Area was used to develop the sediment transport model. The modeling was undertaken to quantify potential maximum plume dispersion, suspended sediment concentrations, and potential maximum sediment deposition thicknesses that may occur due to Project construction.

The sediment transport assessment contained herein includes a description of the Project Components and Project Design Envelope (PDE) that were evaluated (Section J.1.1, Project Description); a discussion of the modeling approach undertaken (Section J.2, Modeling Approach); a summary of the data sources and associated hydrodynamic and sediment characteristics applied (Section J.3, Data Sources); a description of the model runs executed (Section J.4, Sediment Transport Model); and results of the analysis and associated conclusions (Section J.5, Results, and Section J.6, Conclusions).

J.1.1 Project Description

The Project is located off the coast of Virginia (Figure J-1). The boundary of the Lease Area is located 20.45 nautical miles (nm) (37.87 kilometers [km]) from the northwest corner to the Eastern Shore Peninsula and 23.75 nm (43.99 km) from Virginia Beach, Virginia. The Lease Area itself is 13.0 nm (24.08 km) from the westernmost to easternmost edge and 10.4 nm (19.26 km) from the northernmost to southernmost edge. The Lease Area is 112,799 total acres in size.

The onshore components of the Project, which will be located in the cities of Virginia Beach and Chesapeake, Virginia, include the Onshore Export Cable, Switching Station, Interconnection Cable, and an Onshore Substation. The offshore components of the Project, including the Wind Turbine Generators, Offshore Substations, and Inter-Array Cables, are located in federal waters within the Lease Area, while the Offshore Export Cable Route Corridor traverses both federal and state territorial waters of Virginia. During construction, the Project will include temporary construction laydown area(s) and construction port(s) in Europe or North America. The operation stage of the Project includes an onshore Operations and Maintenance facility with an associated Base Port.

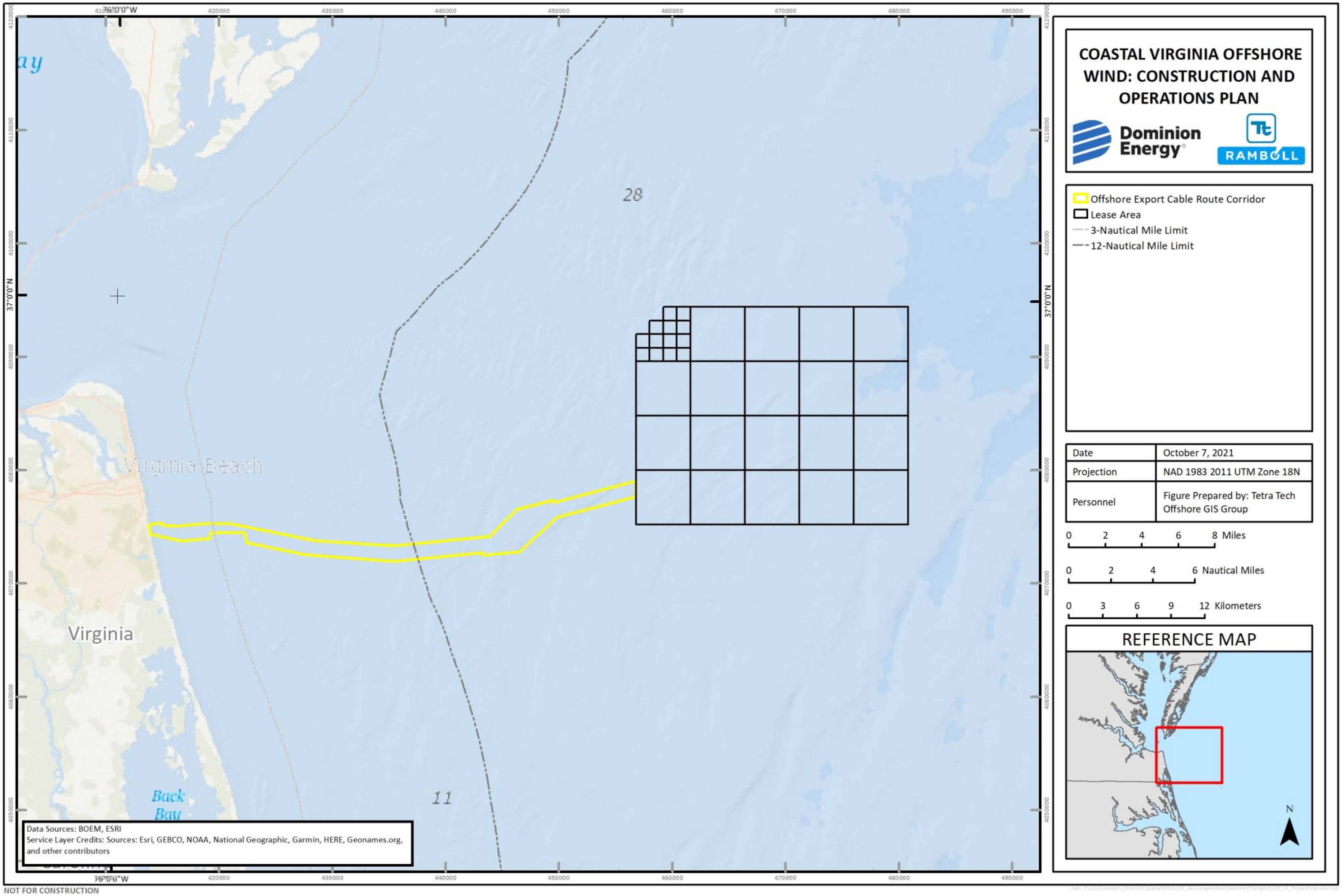

Figure J-1. **Offshore Project Area Overview**

The facility locations for development of the Project were selected based on the preliminary environmental and engineering site characterization studies that have been completed to date. The location of Project facilities will be further refined by the final engineering design as well as ongoing and continuing discussions, agency reviews, public input, and the National Environmental Policy Act review process.

The purpose of this Project is to provide between 2,500 and 3,000 megawatts of clean, reliable offshore wind energy; to increase the amount and availability of renewable energy to Virginia consumers; to create the opportunity to displace electricity generated by fossil fuel-powered plants; and to offer substantial economic and environmental benefits to the Commonwealth of Virginia.

Based on current understanding of site-specific conditions within the Offshore Project Area, Dominion Energy is currently recommending jet trenching, jet plow, mechanical plow, hydroplow, mechanical cutter, and/or other available technologies as the primary cable installation methods. In areas where these methods cannot be employed because of deeper burial requirements or other challenges such as vessel draft requirements, other methods may be employed. In general, the Offshore Export Cables and Inter-Array Cables will be buried to maximum depths of 16.4 feet (ft; 5 meters [m]) and 9.8 ft (3 m), respectively,[a] below the seabed surface.

J.1.2 Modeling Assumptions and the Project Design Envelope Approach

To evaluate how Offshore Export Cable installation would affect suspended sediment concentrations, transport and deposition, Tetra Tech conducted a sediment transport analysis of the Project. Results from a previously developed publicly available hydrodynamic model (Experimental System for Predicting Shelf and Slope Optics [ESPreSSO]) was used to gather information regarding current velocity and direction in the Offshore Project Area. An analytical sediment transport model was developed to predict the fate and transport of sediment suspended by cable installation along the offshore export cable routes. Tetra Tech used site-specific sediment data to inform the analytical model.

The analytical model adopted a PDE approach to evaluate the effects of proposed submarine cable burial activities in terms of suspended sediment concentrations in the water column and sediment transport and deposition characteristics, such as deposition depth and sediment footprint, to assess potential Project effects on surrounding water quality and habitats. The model simulated installation impacts of a single trench. Each trench/cable will be installed separately in space and time during construction (vessel constraints would not allow simultaneous installations), with enough time between installations for disturbed sediment to resettle on the seafloor. The model simulated jet plow installation along the cable route, which would result in greater disturbance of marine sediments than mechanical plow or mechanical cutter installation. Jet plowing therefore provides the maximum expected disturbance of seabed sediment in the Offshore Project Area. This approach is consistent with BOEM's *Draft Guidance Regarding the Use of a Project Design Envelope in a Construction and Operations Plan* (BOEM 2018). This approach provides the Project reasonable flexibility to make prudent development and design decisions prior to

[a] Based on guidance provided by the U.S. Army Corps of Engineers in a letter dated September 20, 2018, submarine cables will be buried to a minimum target burial depth of 15 ft (4.7 m) below the current (and future) authorized depth or depth of existing seabed (whichever is deeper) of federally maintained navigation features (e.g., anchorages and shipping channels).

construction. Therefore, for the purpose of this analysis, the Project has assumed the following as the maximum design scenario:

- Nine proposed Offshore Export Cables;
- Boulder and sandwave removal are not expected;
- The use of a jet plow[b]/jet trenching, because this technology would result in greater disturbance of marine sediments than mechanical plow or mechanical cutter installation;
- A maximum burial depth for the Offshore Export Cables of 16.4 ft (5 m). Trench depth of 18.0 ft (5.5 m) was used in the analysis;
- A maximum burial depth for cables in the Lease Area of 9.8 ft (3 m). Trench depth of 11.4 ft (3.5 m) was used in the analysis;
- The maximum scenario for sediment disturbance will be during construction, during which the disturbance is expected to be equal to or greater than that associated with operation or decommissioning activities; and
- Project activities during operations may include inspection and repair of subsea infrastructure (i.e., cables); however, any impacts are expected to be less than those anticipated during construction since they would only involve a portion of the overall Project. Thus, this assessment focuses on activities and impacts during the construction stage of the Project.[c]

J.2 MODELING APPROACH

The aim of this study is to evaluate the effects of Offshore Export Cable installation and burial activities in terms of suspended sediment concentrations in the water column and sediment deposition characteristics, such as deposition depth and sediment deposition footprint.

The modeling approach uses the publicly available ESPreSSO hydrodynamic model to develop information regarding current velocity and flow direction in the Project Area. This model has been used to obtain velocities and flows for other sediment transport models in the region (Tetra Tech 2015). ESPreSSO uses the Regional Ocean Modeling System (ROMS). ROMS is a three-dimensional, free-surface, terrain-following ocean model that solves the Reynolds-averaged Navier-Stokes equations using the hydrostatic vertical momentum balance and Boussinesq approximation (Haidvogel et al. 2000; Shchepetkin and McWilliams 2005). The ESPreSSO model domain extends from the center of Cape Cod, Massachusetts, southward to Cape Hatteras, North Carolina, with 3 mi (5 km) horizontal resolution and 36 terrain-following vertical levels. The Offshore Project Area falls inside the model domain, which allows model outputs to be used to gather the circulation characteristics within the Offshore Project Area. The current speed and direction from the ESPreSSO model help determine the path of the suspended sediments generated by

[b] The jet plow's water nozzle temporarily loosens the soil, creating a narrow trench. The cable is fed into this trench as the plow moves along the ocean floor. Marine sediment resettles upon the cable, closing the trench with minimal impact to the sea floor. However, some marine sediments may remain suspended in the water column, temporarily increasing total suspended solids, and dispersion of the sediments may cause material to deposit outside the area of disturbance.
[c] A Scour Protection Analysis for impacts associated with operations will be completed and submitted as part of the Fabrication and Installation Report / Facility Design Report.

submarine cable jet plowing activities. More details about the hydrodynamic data used in the sediment transport model are provided in Section J.3.1, Hydrodynamic Data.

An analytical sediment transport model was developed to assess the suspended sediment water column concentrations and sediment deposition characteristics as a result of the submarine cable jet plowing activities. Site-specific sediment grain size distribution data were collected by Geoquip Marine in the Project Area (Geoquip Marine 2020a,b). These sediment characteristics were used to inform the calculations of volume and concentrations of suspended sediment due to jet plowing operations.

Calculations were made along the centerline of the Offshore Export Cable Route Corridor based on the different current velocities available from the ESPreSSO model and the site-specific sediment grab sample data. More detail about the analytical model and the sediment characteristics is provided in Section J.3.1, Hydrodynamic Data and Section J.3.2, Sediment Characteristic Data, respectively. The final results of the analytical model include the extent and duration of suspended sediment concentrations within the water column along the submarine cable routes and the final sediment deposition thickness associated with the jet plowing operations.

J.3 DATA SOURCES

J.3.1 Hydrodynamic Data

As part of the effort to evaluate the variability of ocean currents within the Offshore Project Area, Tetra Tech looked at the publicly available velocity data from the ESPreSSO model.

The ESPreSSO model uses ROMS, which is a free-surface, terrain-following, primitive equations ocean model widely used by the scientific community for a diverse range of applications. ROMS is an open-source model that is continually supported by researchers at Rutgers University, University of California–Los Angeles, and contributors worldwide (Haidvogel et al. 2000; Marchesiello et al. 2003; Peliz et al. 2003). ESPreSSO open boundary values were taken from global Hybrid Coordinate Ocean Model (HYCOM) with adjustments using Mid-Atlantic Ocean Climatological Hydrographic Analysis (MOCHA) climatology and the addition of harmonic tides (Mukai et al. 2002). Meteorology conditions were taken from the North American Mesoscale model. Inflows for the seven largest rivers entering the model were taken from daily average U.S. Geological Survey (USGS) discharge data. Strong constraint four-dimensional variational (4D-Var) data assimilation (Moore et al. 2011) was used to incorporate satellite sea surface height from Jason-2, satellite sea surface temperature from infrared and microwave radiometers, monthly MOCHA temperature, salinity, climatology, and hourly Coastal Ocean Dynamics Applications Radar surface currents (Zavala-Garay et al. 2012).

The ESPreSSO data set included hourly simulations covering the period from October 2009 through February 2014.[d] The ESPreSSO model provides velocity, salinity, and temperature outputs at regularly spaced locations throughout the Offshore Project Area. Hourly bottom velocity outputs at ESPreSSO model stations located within the Offshore Project Area were downloaded for the available period. A rolling 4-hour average velocity was calculated at each hourly time-step for all stations. The 90th percentile of the rolling 4-hour average ebb and flood velocities was selected to represent the potential high velocities during

[d] Model information can be accessed at http://www.myroms.org/espresso/.

these tidal periods. To represent the variability in the flow throughout the Offshore Project Area, velocity data was paired with the closest Geoquip Marine borehole locations in the analytical model.

The velocity stations used in the analytical sediment transport model are shown in Figure J-2. For the purpose of this study, the velocity stations were assigned station identification numbers (Station ID) for easy reference. The stations were also assigned zones based on their proximity to Offshore Project Components. All stations close to the Offshore Export Cable Route Corridor were assigned "Offshore Export Cable Route Corridor" zone and the ones close to the Lease Area were assigned "Lease Area" zone. The current magnitudes at these stations ranged from 1.54 ft per second (ft/s) (0.47 m per second [m/s]) to 2.36 ft/s (0.72 m/s). Table J-1 lists the representative flood and ebb velocities at all the stations. Both ebb and flood velocities were used to calculate the possible maximum extent of sediment deposition and suspended sediment water column concentrations within the Project Area under these conditions.

Table J-1. Maximum Flood and Ebb Current Velocity from the ESPreSSO Model

Station ID	Longitude (W)	Latitude (N)	Depth (m)	Flood Velocity (m/s)	Ebb Velocity (m/s)	Offshore Project Area Zone
1	-75.80	36.79	55	0.68	0.53	Offshore Export Cable Route Corridor
2	-75.69	36.80	63	0.65	0.54	Offshore Export Cable Route Corridor
3	-75.58	36.81	68	0.68	0.49	Offshore Export Cable Route Corridor
4	-75.51	36.86	74	0.69	0.47	Offshore Export Cable Route Corridor/Lease Area
5	-75.40	36.87	84	0.72	0.53	Lease Area
6	-75.45	36.91	84	0.68	0.52	Lease Area
7	-75.34	36.92	93	0.70	0.56	Lease Area
8	-75.23	36.92	105	0.70	0.60	Lease Area
9	-75.28	36.96	101	0.68	0.61	Lease Area
10	-75.22	37.01	112	0.68	0.67	Lease Area

J.3.2 Sediment Characteristic Data

Preliminary sediment characteristic data, including site-specific sediment grain size distribution data and density, were collected throughout the Offshore Project Area by Geoquip Marine in 2020 (Geoquip Marine 2020a,b). Geoquip Marine collected borehole sediment samples in and around the Offshore Project Area at 25 locations. Of the 25 locations where sediment data were collected, 17 locations fell in the Offshore Export Cable Route Corridor and the rest were in the Lease Area (Figure J-3). The borehole sampling evaluated particle size distribution to a depth of between 22.97 and 27.9 ft (7 and 8.5 m) in the Export Cable Route Corridor and as deep as 315 ft (96 m) in the Lease Area. Relative density was performed on select borehole samples.

When cables are installed using jet plowing, only fine sediments, consisting of fine sand and smaller particle sizes, remain suspended in the water column long enough to be transported away from the immediate trench. Larger particle sizes such as coarse sands resettle immediately into the trench (Tetra Tech 2012, 2015); therefore, only finer sand and mud were assessed in the sediment transport model. The sediment sampling provided "percent finer" (percentage of material of the total sample that will pass through the each sieve) for sieve sizes 0.375 in (9.53 millimeter), #4, #10, #20, #40, #60, #100, #140, and #200. For samples equal to or greater than 15 percent finer than the #200 sieve size, sedimentation methods were used to determine the size distribution. Table J-2 shows the sieve sizes or particle size used to define the percent finer for each sediment class.

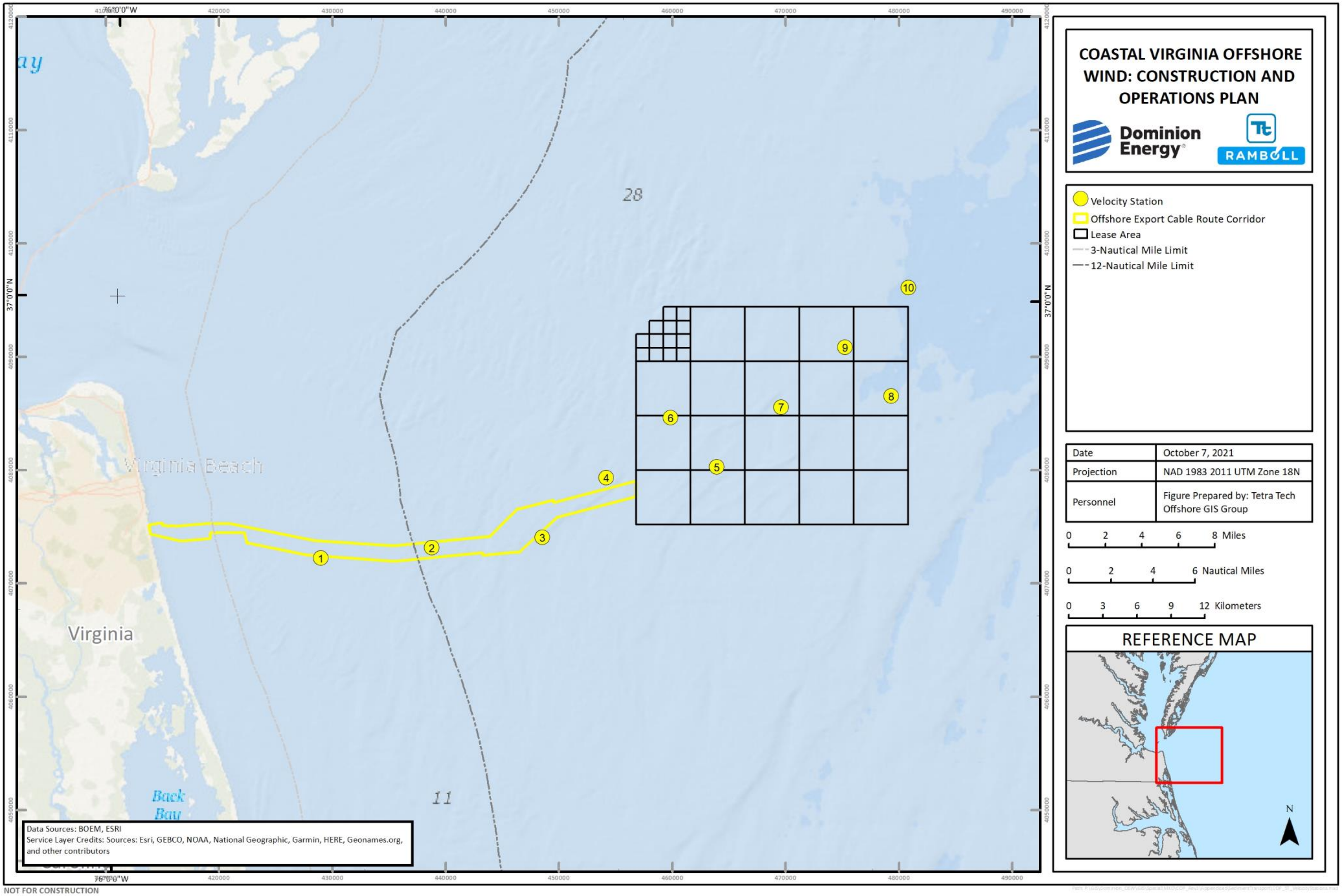

Figure J-2. Velocity Station Locations

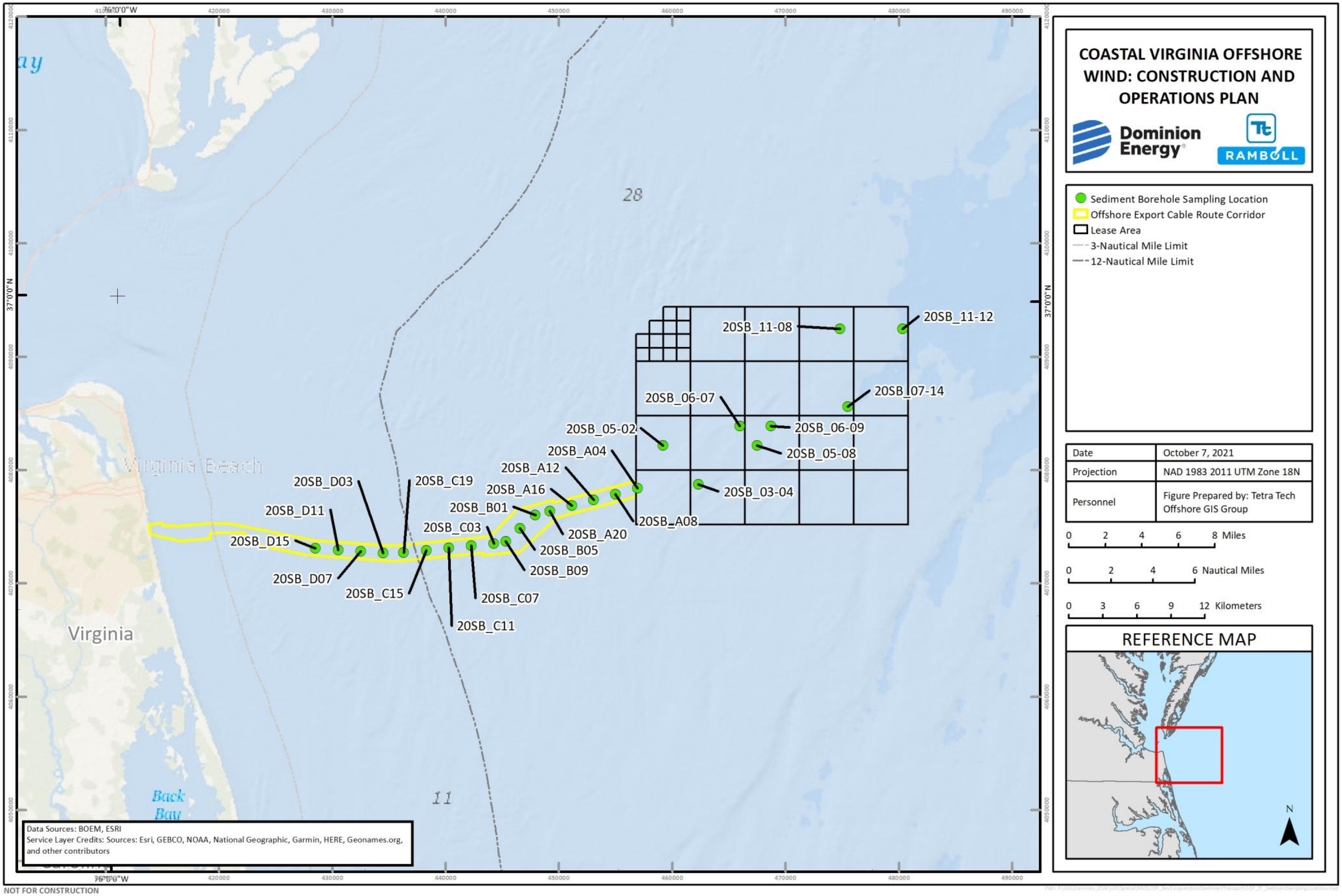

Figure J-3. **Sediment Sampling Locations**

Table J-2. Sediment Class Sieve Size and Particle Size

Sediment Class	Sieve Size	Particle Size (mm)
Gravel	> #4	-
Coarse Sand	#4 – #10	-
Medium Sand	#10 – #20	-
Fine Sand	#20 – #140	-
Very Fine Sand	#140 – #200	-
Silt	-	>0.002
Clay	-	<0.002

Sediment particle percentages from each sample depth were depth-weighted to the maximum trench depth of 18.04 ft (5.5 m) for the Export Cable Route and a maximum depth of 11.48 ft (3.5 m) for the Lease Area, resulting in a representative sediment particle size distribution for each borehole location. For boreholes where none of the samples included additional sedimentation analysis, the silt and clay distribution were equally divided. Settling velocities were assigned to fine sand, very fine sand, silt, and clay classes (USGS 2005). Maximum and minimum density was measured at 21 borehole locations. The maximum sediment density was assigned to each borehole location in the sediment transport model. For borehole locations without measured density, the average of all measured maximum densities, or 2,758 lb/yd^3 (1,636 kilograms per cubic meter [kg/m^3]), was used.

Table J-3 provides the depth-weighted representative sediment particle percentages for the borehole locations in the Offshore Project Area. In 18 sediment sampling locations, fine particles made up more than 80 percent of the total sediment sample. The percentage of fine particles within the sediment samples ranged from 43 percent to 99 percent. On an average, sediment sampling location along the Offshore Export Cable Route Corridor had 81 percent fine sediment while stations in the Lease Area had around 85 percent fine sediment.

Table J-3. Project Area Depth Weighted Sediment Particle Size Distributions and Assumed Density

Sample	Offshore Project Area Zone	Density (kg/m^3)	Coarse Sediment (%)	Fine Sand (%)	Very Fine Sand (%)	Silt (%)	Clay (%)
20SB_03-04[a]	Lease Area	1,560	54.71	39.86	0.51	4.02	0.89
20SB_05-02	Lease Area	1,560	2.43	51.71	29.29	10.22	6.35
20SB_05-08	Lease Area	1,500	4.00	65.36	18.79	7.11	4.74
20SB_06-07	Lease Area	1,636	9.60	81.40	2.70	3.44	2.86
20SB_06-09	Lease Area	1,520	8.67	48.59	5.34	23.05	14.35
20SB_07-14[b]	Lease Area	1,710	29.14	61.71	4.07	2.92	2.15
20SB_11-08	Lease Area	1,490	3.71	72.29	3.00	14.87	6.13
20SB_11-12[c]	Lease Area	1,420	9.80	52.41	1.28	10.39	26.11
20SB_A04	Export Cable Route Corridor	1,790	44.02	35.29	2.05	11.26	7.38
20SB_A08	Export Cable Route Corridor	1,780	55.82	40.42	0.66	1.55	1.55
20SB_A12	Export Cable Route Corridor	1,770	37.15	58.50	0.97	1.69	1.69
20SB_A16	Export Cable Route Corridor	1,690	8.32	75.65	7.19	6.95	1.90
20SB_A20	Export Cable Route Corridor	1,636	2.25	88.13	4.37	2.62	2.62
20SB_B01	Export Cable Route Corridor	1,680	10.41	79.46	4.11	3.01	3.01

Sample	Offshore Project Area Zone	Density (kg/m^3)	Coarse Sediment (%)	Fine Sand (%)	Very Fine Sand (%)	Silt (%)	Clay (%)
20SB_B05	Export Cable Route Corridor	1,720	7.95	80.25	5.79	3.01	3.01
20SB_B09	Export Cable Route Corridor	1,700	4.98	84.21	4.90	2.95	2.95
20SB_C03	Export Cable Route Corridor	1,650	10.45	79.20	3.73	3.31	3.31
20SB_C07	Export Cable Route Corridor	1,590	6.10	41.77	14.86	34.18	3.09
20SB_C11	Export Cable Route Corridor	1,690	19.91	74.03	1.52	2.27	2.27
20SB_C15	Export Cable Route Corridor	1,636	16.78	39.55	4.73	25.74	13.20
20SB_C19	Export Cable Route Corridor	1,636	16.35	40.30	3.02	24.96	15.37
20SB_D03	Export Cable Route Corridor	1,480	29.91	23.38	14.67	23.42	8.61
20SB_D07	Export Cable Route Corridor	1,720	29.04	35.64	2.65	21.00	11.67
20SB_D11	Export Cable Route Corridor	1,630	10.98	65.53	9.00	10.35	4.13
20SB_D15	Export Cable Route Corridor	1,700	14.84	69.69	3.49	8.74	3.24

Note:
Total sediment = coarse sediment + fine sand + very fine sand + silt + clay. Values may not add to 100 percent due to rounding.
[a]Combined with 20SB_03-04A
[b]Combined with 20SB_07-14A
[c]Combined with 20SB_11-12A

J.4 SEDIMENT TRANSPORT MODEL

This section describes the methodology followed to develop the conservative analytical sediment transport model to characterize the potential maximum sediment transport and deposition scenario for the jet plow activities. The model simulates sediment resuspension due to jet plow operations and analyzes suspended sediment concentrations and subsequent sediment deposition pattern in the water column to determine potential sediment impacts during Project installation activities. The analytical model incorporates the hydrodynamic data from the ESPreSSO model. The sediment settling and transport assumptions are conservative in nature so that the expected maximum water quality column concentrations and potential sediment transport are calculated. The analytical model is based on the physical laws governing transport of sediment due to local current conditions, and the settling of sediment is based on Stokes Law. Assumptions used to develop a project design envelope approach for the sediment transport analysis are listed in detail in Section J.4.1, Model Setup and Parametrization.

J.4.1 Model Setup and Parametrization

Jet plowing utilizes high-pressured water jets to fluidize soil as the machine traverses along a submarine cable route. The cable descends into a temporary trench incised by the jetting blades and is subsequently buried as the fluidized sediments resettle inside the trench. During jet plow operations, the operator monitors the burial and adjusts the angle of the jetting blades and the water pressure to obtain desired burial depth while minimizing sediment mobilization into the water column.

By design, coarser sediments settle immediately to fill the trench and bury the cable or settle in the immediate vicinity, typically within a foot (Tetra Tech 2012, 2015; Vinhateiro et al. 2013). An earlier study has shown that sediments coarser than 0.2 mm settle immediately over the trench (Tetra Tech 2015). A conservative approach was taken by assuming that sediments finer than 0.25 mm (fine sand) would be mobilized into the water column and transported by the ambient currents varying distances depending on a number of factors.

The height of the sediment plume above the seabed is dependent on local hydrodynamics, sediment size distribution, and the jet plow operating parameters. Previous studies have shown that the plume of sediment released during jet plowing reaches heights of roughly 7 ft (2 m) above the seabed (Tetra Tech 2012, 2015). The suspended sediment plume is then dispersed by local tidal currents and moves in the direction of the dominant current, which for the Project would be northward during flood tides and southward during ebb tides. Tidal conditions and currents will be dependent on current conditions during each stage of Project construction. The analytical sediment transport model simulated transport for both the maximum flood and ebb conditions to better estimate potential transport in both directions.

Settling velocity determines the time it takes for a fine grain sediment to settle back to the seabed based on Stokes Law. Based on the sediment grain size distribution, representative sediment classes were selected and settling velocities were assigned to those classes (USGS 2005). However, in many instances, the fine clay and silt sediment particles become cohesive when they are forced into resuspension by the jet plow, causing them to have settling velocities similar to larger sized particles (Swanson et al. 2015; Van Rijn 2019). The settling velocities determine the duration for which the resuspended sediment remains in the water column before eventually settling to the seabed. These velocities have been assigned to each sediment class based on a USGS study (USGS 2005). Table J-4 lists the different sediment classes and the associated settling velocities used for the modeling.

Table J-4. Project Sediment Particle Diameter Classes and Settling Velocity

Sediment Class	Settling Velocity (cm/s)
Fine Sand	3.000
Very Fine Sand	1.000
Silt	0.126
Clay	0.023

J.4.2 Methodology

This section describes how the analytical sediment transport model was implemented to calculate the maximum suspended sediment water column concentrations and deposition depths. The approach assumes that the fine sediments released from the jet plow are released at a fixed height. The sediment particles are then transported by local tidal currents and settle down at fixed rates over the horizontal sea floor (Tetra Tech 2012, 2015; Vinhateiro et al. 2013; Swanson et al. 2015). No secondary resuspension of sediment particles was considered. Resuspension is a result of the naturally occurring bottom currents and turbulence and is therefore not directly related to jet plowing activities. The model focuses on the initial dispersion of particles due to jet plowing activities that may generate brief episodes of elevated fine sediment concentrations in the water column and the resulting transport and deposition of these suspended sediments.

The expected sediment transport was calculated for each sediment sampling location. It was assumed that these stations would be representative of the general conditions of the Offshore Project Area. Each sediment sample location was assigned the representative flood and ebb velocities that corresponded to the velocity station and sediment characteristics based on the Offshore Project Area zone it fell in. The flood and ebb velocities were used to calculate the maximum extent of sediment deposition and the duration for which the sediment remained in suspension for each sediment class at all stations.

The travel speed of the jet plow was assumed at 656 ft per hour (200 m per hour). For the model analysis, it was assumed that 30 minutes of trenching activities were suspended at each time-step. Based on the provided specifications, the trench was assumed to be 328 ft (100 m) long [e], 4.9 ft (1.5 m) wide, and 18.0 ft (5.5 m) deep for trenching in the Offshore Export Route Corridor. Therefore, for each sediment location, the maximum volume of potential sediment fluidized in the water column was 29,135 cubic feet (825 cubic meters) if all of it is fine sand or smaller. For trenches within the Lease Area, the trench was assumed to be 328 ft (100 m) long, 4.9 ft (1.5 m) wide, and 11.5 ft (3.5 m) deep with a maximum volume of 18,540 cubic feet (525 cubic meters) if all of it is fine sand or smaller.

This volume of sediment was assumed to be instantaneously suspended at time-step zero seconds in the analytical sediment transport model. This conservative assumption results in a higher concentration of suspended sediments in the water column than if a smaller volume of sediments at a shorter time-step were suspended; however, it does not impact deposition depths.

The sediment concentration at the release location was determined based on the estimated bed sediment and the percentage of sediment in each class. The sediment concentrations of each class were added together to calculate the total volume of sediment resuspended at the release point. With time, the sediment plume was allowed to grow based on the velocity at that location. The sediment plume does not grow in the vertical direction and is always close to the bottom of the water column. The duration of suspension for each sediment class was calculated using the release height and sediment class settling velocity. The maximum extent of travel for each sediment class was calculated using the current velocity and sediment settling velocity. Sediment particles in each class were assumed to settle out of the water column at a linear rate. The suspended sediment concentrations at each location along the trench were calculated based on the sediment left in the water column at the time and the size of the plume.

The point of deposition for each particle was calculated based on the settling velocity of each sediment class. Coarser sediments with higher settling velocity settle out of the water column faster and closer to the release point as compared to finer sediments. The finer sediment classes remain in the water column for longer periods of times and are advected further than the coarser sediments. In addition, the finer clay and silt sediment particles, which are typically cohesive, undergo enhanced settling due to flocculation and settle out of the water column with large-sized particles (Swanson et al. 2015; Van Rijn 2019). Sediments were assumed to settle out of the water column at a linear rate for each sediment particle class, i.e., varying sized sediments within each class were assigned to be evenly distributed within the plume. Sediment classes larger than medium silt all deposited within an hour, while fine silts and clays remained in suspension for several hours. In addition, the model did not explicitly simulate dispersion, which could cause some

[e] Dominion Energy assumed a jet plow speed of 656 ft (200 m) per hour. As a conservative assumption, the model assumed that all the fine material dislodged by the jet plow during an interval of 30 minutes would be dispersed into the water column at the same time.

particles to be transported further than estimated, but this mostly impacts smaller particles that will most likely stay in suspension. Instead, dispersion was represented by the plume growth in terms of spreading of the sediment particles based on the ambient currents and the settling velocity.

J.5 RESULTS

This section describes the sediment transport analytical model results in terms of suspended sediment concentrations, deposition depth, and distance at which the sediment is deposited. Results of the conservative analytical sediment transport model representing the Offshore Project Area are provided at all locations with available velocity data.

J.5.1 Suspended Sediment Concentrations

Table J-5 and Figure J-5 list the predicted maximum suspended sediment concentrations by distance from the trench centerline at locations perpendicular to the trench centerline for all sample stations for flood and ebb currents, respectively. Figure J-4 and Figure J-5 show the estimated maximum suspended sediment concentrations for maximum flood and ebb tides at two representative sediment sample locations—20SB_A08 (Cable Route) and 20SB_C19 (Cable Route). These same values are shown throughout the Offshore Project Area in Figure J-6 and Figure J-7, respectively. The silt and clay sediment percentage is 3 percent at 20SB_A08 and 40 percent at 20SB_C19. These stations were chosen to ensure that the variability in fine sediment percentage is captured well. Table J-8 shows the expected maximum instantaneous suspended sediment concentrations at any given time-step along the cable installation routes. Figure J-6 was developed using one representative cable within the Offshore Project Area. It is important to note that these concentrations do not occur at all locations simultaneously. Given the speed of the jet plow, only small sections of the Offshore Project Area would be disturbed at any given time during Project construction, which is the reason the model used the volume of sediment put into suspension in 30 minutes of jet plow travel (trench length of 328 ft [100 m]). In addition, due to the depth of water within the Offshore Project Area, the plume should not be visible from the surface. The plume concentrations are typically lower at all non-riverine stations due to lesser fine sediment content, plume dispersion, and sediment deposition.

Twenty-three of 25 sediment sampling locations had a fine sediment content of more than 50 percent. Typically, stations had around 8 percent silt and clay. On an average, sediment sampling locations along the Offshore Cable Route Corridor had 81 percent fine sediment while stations in the Lease Area had around 85 percent fine sediment. The type of fine sediments at each location impacted the maximum plume concentrations. Fine sand, the coarsest fine sediment particle class, has a settling velocity of 5.9 ft/min (3 cm per second) and remains in suspension for approximately 1 minute. Therefore, at locations with higher sand content, suspended sediment concentrations decreased by 69 percent or greater within 1 minute of jet plowing operations. This reduced the amount of sediment that could be transported in the water column due to currents, and most of the fine sand deposits within 16.4 ft (5 m) of the trench centerline.

J.5.1.1 Offshore Export Cable Route Corridor

The fine sediment content along the Offshore Export Cable Route Corridor varied from a low of 56 percent at sampling location 20SB_A04 to a high of 98 percent at 20SB_A20. Maximum plume horizontal distances varied between 1,640 ft and 3,280 ft (500 m and 1,000 m) for flood tides (Table J-5). Maximum plume distances were always less than 820 ft (250 m) for ebb tides (Table J-6).

Expected maximum suspended sediment concentrations were between 46 milligrams per liter (mg/L) and 364 mg/L at 1,150 ft (350 m) from the trench centerline for flood tides. For ebb tides, expected maximum suspended sediment concentration was zero mg/L and reached background concentration 1,150 ft (350 m) from the trench centerline. Studies have shown suspended sediment concentrations of anywhere from 50 to 1,000 mg/L at distances around 1,000 ft (300 m) from the centerline (Tetra Tech 2012, ESS Group 2013; Swanson et al. 2015). The sediment plume was confined near the substrate layer and is not expected to reach the surface.

The potential maximum suspended sediment concentrations were dependent on the burial depth and total percent fines at each sampling location. Stations with higher percentages of fine sediment particle classes had higher concentrations of suspended sediments because more particles were suspended during jet plowing. If a station had a total percent fine sediment composition of 50 percent, half of the disturbed sediments would be mobilized into the water column following resuspension by the jet plow. Assuming a trench depth of 18.0 ft (5.5 m), slightly over 8.2 ft (2.5 m) of fine sediments would be resuspended into the water column. The highest concentrations occurred at the release point, and concentrations decreased further from the trench. These concentrations, specifically at the trench, were confined close to the substrate. For sediment sampling locations that had at least 80 percent fine sediments, nearly all of the material disturbed by the jet plow would be released into the water column. The conservative sediment transport model predicted that maximum suspended sediment concentration would be greater than 4.44×10^6 mg/L at the release point during flood and ebb conditions. For stations with lower fine sediment percentage (less than 45 percent), the predicted maximum suspended sediment concentration is lower than 2.20×10^6 mg/L at the release point.

J.5.1.2 Lease Area

At the Lease Area sediment sampling locations, maximum plume distances were typically between 820 and 3,280 ft (250 m and 1,000 m). The plume traveled further distances during the flood tide as compared to the ebb tide. The total distance the sediment plumes traveled was dependent on the current velocities. Suspended sediment concentrations were always below 620 mg/L at a distance of 820 ft (250 m) from trench centerline during flood and ebb tides. Results indicated that the plume would travel to a maximum distance of 3,280 ft (1,000 m) during the flood tide, although the maximum suspended sediment concentrations at that distance would be typically less than 3 mg/L. During ebb tides, the maximum plume distance traveled is typically around 820 ft (250 m). Expected maximum suspended sediment concentrations drop to below 50 mg/L at 1,640 ft (500 m) from the trench centerline during flood tides and at 820 ft (250 m) during ebb tides. Maximum plume distance at any station depends on the current velocity and its components perpendicular and parallel to the direction of trench movement.

The sediment transport model predicted that maximum suspended sediment concentrations would be around 1.90×10^6 mg/L for sediment sampling locations at the release point during flood and ebb conditions. For flood tides, the suspended sediment concentration averaged around 1,600 mg/L at a distance of 328 ft (100 m), and for ebb tides, the concentrations averaged around 169 mg/L at a travel distance of 328 ft (100 m).

J.5.1.3 General Observations

While the maximum suspended sediment concentrations were relatively high for sediment sampling locations in the Offshore Project Area, these concentrations decreased rapidly with time. The coarser fine particles, such as fine sand, remained in suspension for about 1 minute, while the very fine sediments (clay) remained in suspension for about 4 hours, a relatively short period of time. In areas that consist predominantly of gravels and sands, the analysis indicates a limited extent of increased sediment concentrations because the larger grain size sediments immediately deposit in the trench. In locations that are dominated by fine sand, silts, or clays, these sediments can be released into the water column and temporarily increase total suspended solids near the trench and cause sediment deposition outside of the trench, but eventually settle down to background concentrations (Tetra Tech 2012, 2015; Vinhateiro et al. 2013). Table J-7 and Table J-8 present the time varying suspended sediment concentrations for flood and ebb tides, respectively, for all sediment sampling locations. The concentrations decreased rapidly with time, and water column concentrations are expected to return to ambient conditions within 4 hours (14,400 seconds).

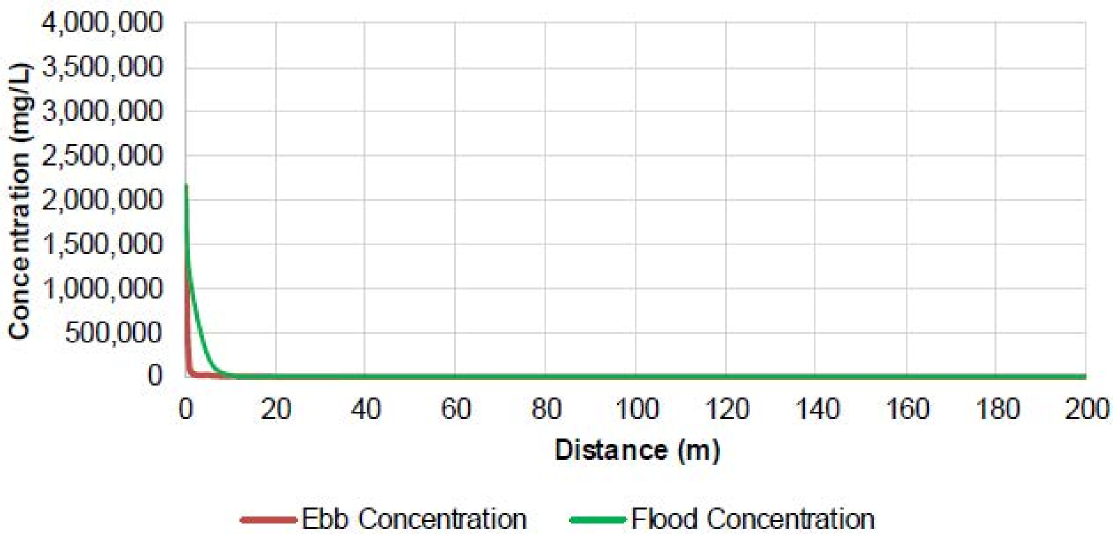

Figure J-4. Maximum Flood and Ebb Tide Suspended Sediment Concentrations at 20SB_A08 (3% clay and silt)

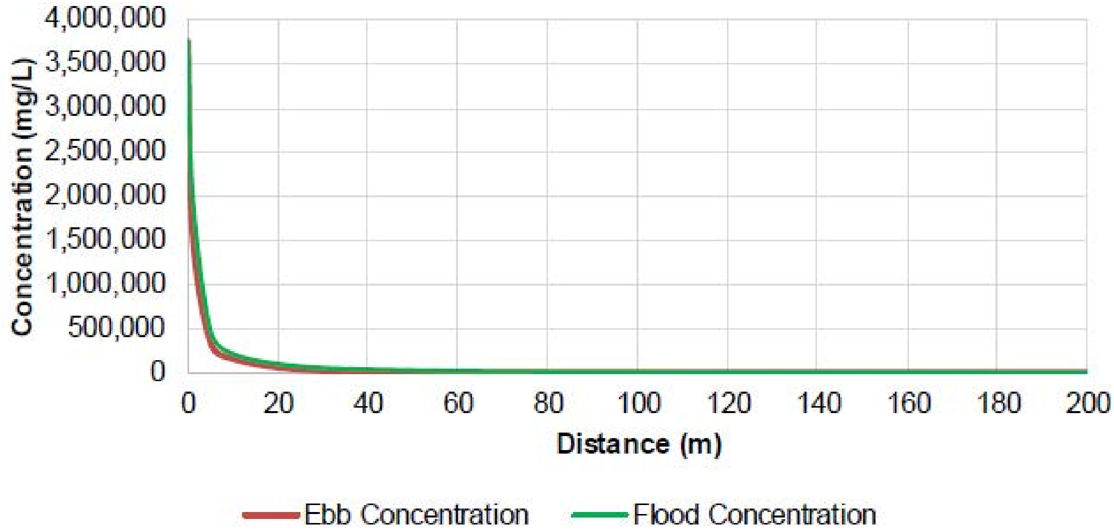

Figure J-5. Maximum Flood and Ebb Tide Suspended Sediment Concentrations at 20SB_C19 (40% clay and silt)

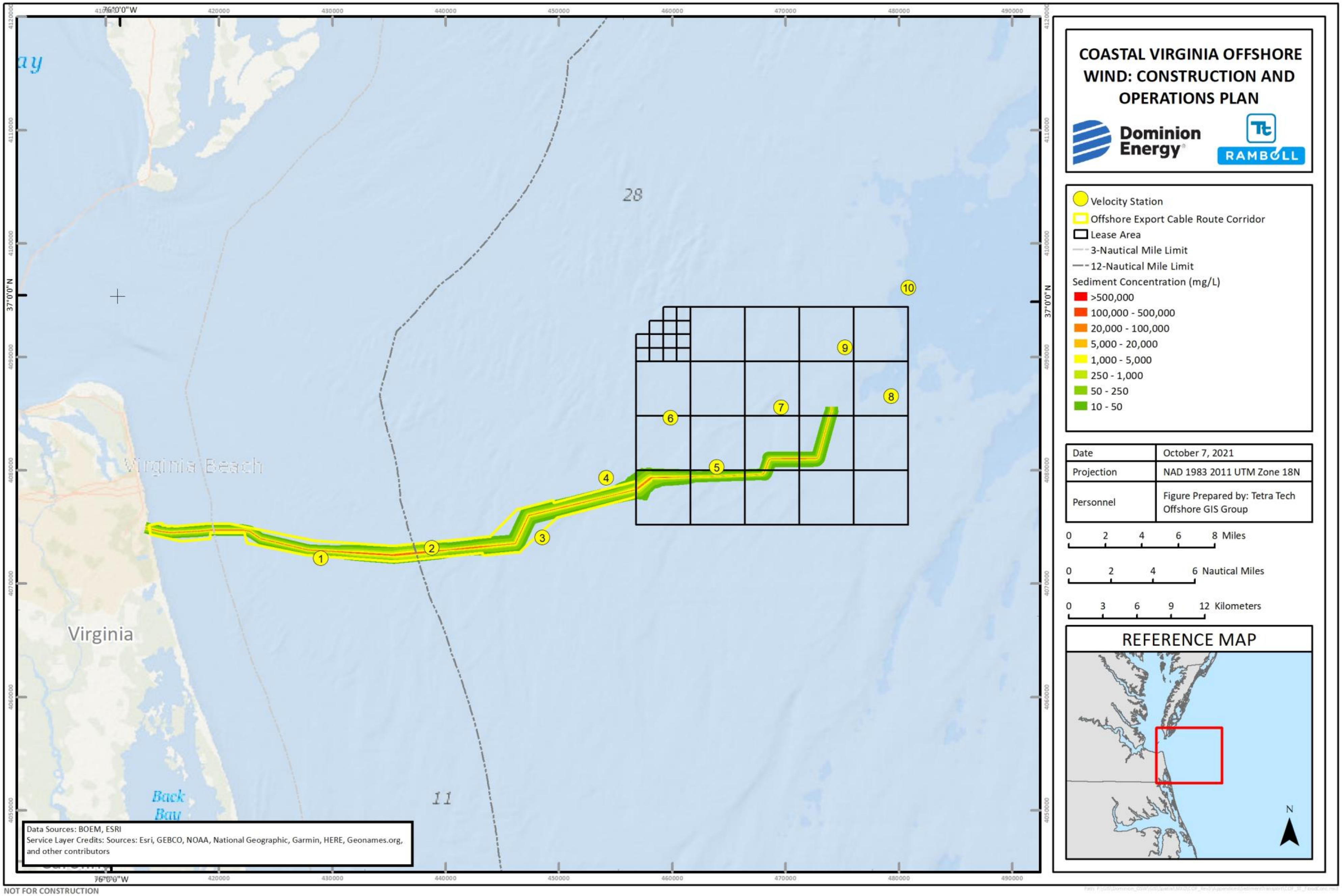

Figure J-6. Maximum Flood Tide Suspended Sediment Concentrations Along Representative Offshore Export Cable Route

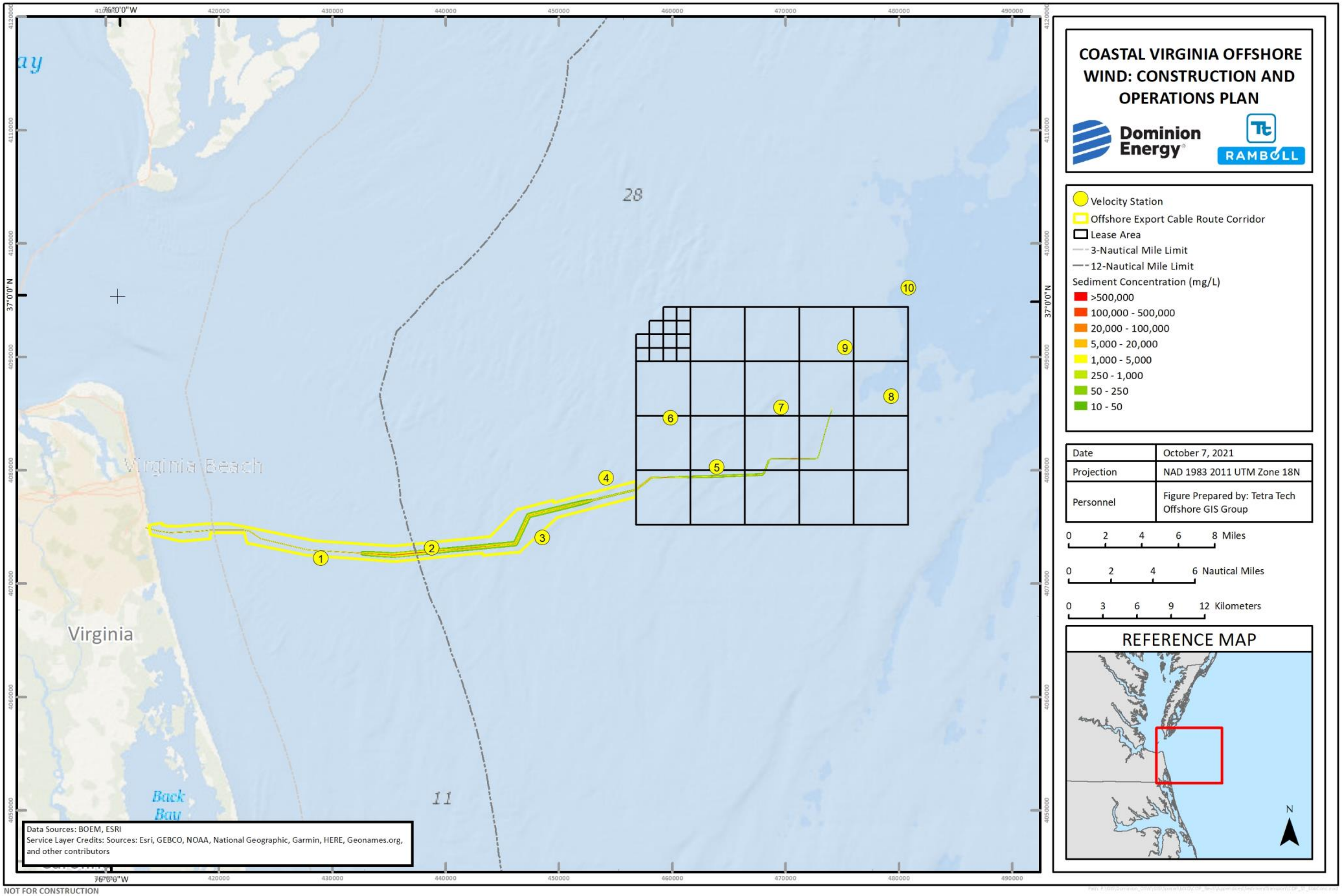

Figure J-7. Maximum Ebb Tide Suspended Sediment Concentrations Along Representative Offshore Export Cable Route

Table J-5. Project Maximum Suspended Sediment Concentrations for Flood Conditions (with Distance)

Sample	Project Element	Total Fines (%)	Distance from Trench (m)															
			0	1	5	10	25	50	75	100	150	250	350	500	800	1,000	2,500	5,000
			Maximum Sediment Concentration (mg/L)															
20SB_03-04	Lease Area	45.3%	846,300	456,795	97,108	12,657	4,540	1,812	950	553	207	33	17	8	2	1	0	0
20SB_05-02	Lease Area	97.6%	1,899,300	1,047,784	260,513	74,287	10,342	4,026	2,168	1,305	542	149	76	33	7	2	0	0
20SB_05-08	Lease Area	96.0%	1,856,250	1,001,728	212,570	52,293	9,757	3,871	2,024	1,183	459	137	67	27	5	0	0	0
20SB_06-07	Lease Area	90.4%	1,840,179	967,894	163,611	16,680	4,820	1,928	1,018	603	244	76	37	15	3	0	0	0
20SB_06-09	Lease Area	91.3%	1,740,780	971,752	259,906	101,761	34,372	13,603	7,089	4,128	1,580	462	226	93	16	0	0	0
20SB_07-14	Lease Area	70.9%	1,590,300	828,493	126,649	20,215	4,970	1,916	975	555	200	66	31	12	1	0	0	0
20SB_11-08	Lease Area	96.3%	1,817,800	949,943	150,171	29,160	10,053	3,807	1,886	1,030	315	96	46	18	2	0	0	0
20SB_11-12	Lease Area	90.2%	1,545,670	844,798	196,935	73,222	26,930	11,017	5,999	3,698	1,683	611	292	114	14	0	0	0
20SB_A04	Offshore Export Cable Route Corridor	56.0%	2,755,705	1,531,481	399,335	118,276	42,504	17,566	9,637	5,919	2,587	697	360	161	39	13	0	0
20SB_A08	Offshore Export Cable Route Corridor	44.2%	2,162,700	1,163,622	241,206	20,878	7,171	2,973	1,655	1,035	475	146	75	34	8	3	0	0
20SB_A12	Offshore Export Cable Route Corridor	62.9%	3,059,445	1,642,967	335,298	23,612	7,842	3,230	1,798	1,124	516	158	82	36	9	3	0	0
20SB_A16	Offshore Export Cable Route Corridor	91.7%	4,260,913	2,289,984	470,355	73,496	18,186	7,214	3,758	2,169	785	154	78	34	7	2	0	0
20SB_A20	Offshore Export Cable Route Corridor	97.7%	4,396,800	2,343,155	448,002	42,882	10,773	4,444	2,430	1,492	659	207	104	45	10	2	0	0
20SB_B01	Offshore Export Cable Route Corridor	89.6%	4,139,100	2,209,932	429,477	47,407	12,676	5,234	2,862	1,758	776	244	123	53	11	2	0	0
20SB_B05	Offshore Export Cable Route Corridor	92.1%	4,354,180	2,327,728	457,363	54,408	12,992	5,355	2,928	1,798	794	249	126	54	11	2	0	0
20SB_B09	Offshore Export Cable Route Corridor	95.0%	4,442,100	2,371,376	460,291	50,115	12,612	5,203	2,845	1,747	771	242	122	53	11	2	0	0
20SB_C03	Offshore Export Cable Route Corridor	89.5%	4,063,125	2,170,455	423,637	48,536	13,685	5,655	3,092	1,899	838	263	133	57	12	3	0	0
20SB_C07	Offshore Export Cable Route Corridor	93.9%	4,105,778	2,242,715	520,228	217,246	62,473	21,518	9,380	4,186	436	158	71	24	0	0	0	0
20SB_C11	Offshore Export Cable Route Corridor	80.1%	3,722,225	1,877,066	181,254	28,046	8,679	3,288	1,647	921	341	123	56	19	0	0	0	0
20SB_C15	Offshore Export Cable Route Corridor	83.2%	3,743,332	2,046,500	477,587	210,863	70,111	25,667	12,277	6,428	1,918	693	313	107	0	0	0	0
20SB_C19	Offshore Export Cable Route Corridor	83.6%	3,762,552	2,057,272	480,530	214,456	73,125	27,017	13,089	6,986	2,233	807	364	124	0	0	0	0
20SB_D03	Offshore Export Cable Route Corridor	70.1%	2,852,700	1,585,331	411,833	179,612	51,594	18,592	8,693	4,392	1,133	409	185	63	0	0	0	0
20SB_D07	Offshore Export Cable Route Corridor	71.0%	3,356,580	1,774,772	345,244	172,354	55,266	18,234	7,767	3,454	1,338	432	169	36	0	0	0	0
20SB_D11	Offshore Export Cable Route Corridor	89.0%	3,990,240	1,983,244	193,937	83,521	22,856	7,362	3,013	1,237	449	145	57	12	0	0	0	0
20SB_D15	Offshore Export Cable Route Corridor	85.2%	3,981,400	1,947,354	141,246	65,894	19,641	6,294	2,553	1,027	367	119	46	10	0	0	0	0

Table J-6. Project Maximum Suspended Sediment Concentrations for Ebb Conditions (With Distance)

Sample	Project Element	Total Fines (%)	Distance from Trench (m)															
			0	1	5	10	25	50	75	100	150	250	350	500	800	1,000	2,500	5,000
			Maximum Sediment Concentration (mg/L)															
20SB_03-04	Lease Area	45.3%	846,300	122,281	16,958	6,595	643	112	42	17	0	0	0	0	0	0	0	0
20SB_05-02	Lease Area	97.6%	1,899,300	243,250	25,648	6,364	847	95	0	0	0	0	0	0	0	0	0	0
20SB_05-08	Lease Area	96.0%	1,856,250	109,300	11,629	2,675	172	0	0	0	0	0	0	0	0	0	0	0
20SB_06-07	Lease Area	90.4%	1,840,179	54,095	6,217	1,490	96	0	0	0	0	0	0	0	0	0	0	0
20SB_06-09	Lease Area	91.3%	1,740,780	384,817	39,951	9,058	583	0	0	0	0	0	0	0	0	0	0	0
20SB_07-14	Lease Area	70.9%	1,590,300	46,273	2,769	476	0	0	0	0	0	0	0	0	0	0	0	0
20SB_11-08	Lease Area	96.3%	1,817,800	505,767	44,011	19,118	3,700	556	238	117	31	0	0	0	0	0	0	0
20SB_11-12	Lease Area	90.2%	1,545,670	693,488	123,854	59,689	17,332	4,972	2,196	1,214	462	77	0	0	0	0	0	0
20SB_A04	Offshore Export Cable Route Corridor	56.0%	2,755,705	540,827	129,704	41,636	5,366	974	141	0	0	0	0	0	0	0	0	0
20SB_A08	Offshore Export Cable Route Corridor	44.2%	2,162,700	94,469	22,199	7,547	1,121	203	29	0	0	0	0	0	0	0	0	0
20SB_A12	Offshore Export Cable Route Corridor	62.9%	3,059,445	106,030	24,120	8,200	1,218	221	32	0	0	0	0	0	0	0	0	0
20SB_A16	Offshore Export Cable Route Corridor	91.7%	4,260,913	1,379,459	86,174	35,619	7,749	898	409	215	69	0	0	0	0	0	0	0
20SB_A20	Offshore Export Cable Route Corridor	97.7%	4,396,800	1,335,534	50,847	21,741	5,521	1,202	547	288	92	0	0	0	0	0	0	0
20SB_B01	Offshore Export Cable Route Corridor	89.6%	4,139,100	1,275,459	58,901	25,607	6,503	1,416	645	339	109	0	0	0	0	0	0	0
20SB_B05	Offshore Export Cable Route Corridor	92.1%	4,354,180	1,354,843	62,141	26,197	6,653	1,448	660	347	111	0	0	0	0	0	0	0
20SB_B09	Offshore Export Cable Route Corridor	95.0%	4,442,100	1,367,355	59,502	25,454	6,464	1,407	641	337	108	0	0	0	0	0	0	0
20SB_C03	Offshore Export Cable Route Corridor	89.5%	4,063,125	1,256,857	62,781	27,666	7,026	1,529	697	366	118	0	0	0	0	0	0	0
20SB_C07	Offshore Export Cable Route Corridor	93.9%	4,105,778	1,743,984	311,174	131,997	24,764	1,259	562	290	89	0	0	0	0	0	0	0
20SB_C11	Offshore Export Cable Route Corridor	80.1%	3,722,225	1,070,358	41,842	18,838	4,593	985	440	227	70	0	0	0	0	0	0	0
20SB_C15	Offshore Export Cable Route Corridor	83.2%	3,743,332	1,595,804	335,326	150,680	33,663	5,538	2,472	1,275	392	0	0	0	0	0	0	0
20SB_C19	Offshore Export Cable Route Corridor	83.6%	3,762,552	1,604,860	347,447	157,572	36,065	6,448	2,878	1,485	456	0	0	0	0	0	0	0
20SB_D03	Offshore Export Cable Route Corridor	70.1%	2,852,700	1,300,326	255,036	110,388	23,626	3,270	1,460	753	231	0	0	0	0	0	0	0
20SB_D07	Offshore Export Cable Route Corridor	71.0%	3,356,580	788,859	116,814	22,334	2,557	0	0	0	0	0	0	0	0	0	0	0
20SB_D11	Offshore Export Cable Route Corridor	89.0%	3,990,240	328,688	45,597	7,496	858	0	0	0	0	0	0	0	0	0	0	0
20SB_D15	Offshore Export Cable Route Corridor	85.2%	3,981,400	282,909	38,686	6,123	701	0	0	0	0	0	0	0	0	0	0	0

Table J-7. Project Maximum Suspended Sediment Concentrations for Flood Conditions (With Time)

Sample	Project Element	Total Fines (%)	Time (seconds)															
			0	10	20	30	60	90	120	150	240	300	600	1,200	1,800	3,600	7,200	14,400
			Maximum Sediment Concentration (mg/L)															
20SB_03-04	Lease Area	45.3%	846,300	386,129	220,916	136,290	26,685	10,435	7,649	5,914	3,300	2,458	837	165	36	8	1	0
20SB_05-02	Lease Area	97.6%	1,899,300	922,601	559,100	369,937	121,130	61,396	38,198	23,926	7,735	5,826	2,109	520	176	41	3	0
20SB_05-08	Lease Area	96.0%	1,856,250	930,350	563,210	367,088	104,097	50,092	32,564	21,724	8,672	6,520	2,343	577	198	45	4	0
20SB_06-07	Lease Area	90.4%	1,840,179	895,060	520,592	320,776	53,584	16,084	11,324	8,359	4,287	3,230	1,176	302	110	25	2	0
20SB_06-09	Lease Area	91.3%	1,740,780	907,481	576,681	399,689	161,385	98,438	71,831	55,179	30,542	22,949	8,215	1,994	669	153	13	0
20SB_07-14	Lease Area	70.9%	1,590,300	814,287	486,706	306,875	60,668	22,201	15,143	10,741	5,031	3,785	1,363	340	119	27	2	0
20SB_11-08	Lease Area	96.3%	1,817,800	935,122	561,963	356,907	75,709	31,551	23,307	18,113	10,212	7,655	2,688	600	174	40	3	0
20SB_11-12	Lease Area	90.2%	1,545,670	821,540	519,752	354,807	128,992	76,941	57,580	45,371	26,487	20,178	7,792	2,376	1,044	239	20	0
20SB_A04	Offshore Export Cable Route Corridor	56.0%	2,755,705	1,296,079	777,489	512,612	169,216	95,812	70,181	54,228	30,440	22,939	8,341	2,084	719	167	14	0
20SB_A08	Offshore Export Cable Route Corridor	44.2%	2,162,700	971,600	548,855	333,257	54,839	16,809	12,170	9,286	5,107	3,864	1,439	390	150	35	3	0
20SB_A12	Offshore Export Cable Route Corridor	62.9%	3,059,445	1,370,728	771,402	465,776	71,183	18,925	13,586	10,271	5,549	4,199	1,564	424	163	38	3	0
20SB_A16	Offshore Export Cable Route Corridor	91.7%	4,260,913	2,013,046	1,171,606	733,045	156,689	63,239	43,076	30,588	14,346	10,729	3,718	771	186	43	4	0
20SB_A20	Offshore Export Cable Route Corridor	97.7%	4,396,800	2,054,627	1,178,105	721,421	121,802	36,929	25,226	17,976	8,562	6,477	2,406	649	249	58	5	0
20SB_B01	Offshore Export Cable Route Corridor	89.6%	4,139,100	1,938,887	1,115,445	686,385	122,920	40,977	28,328	20,483	10,084	7,628	2,834	765	294	68	6	0
20SB_B05	Offshore Export Cable Route Corridor	92.1%	4,354,180	2,043,009	1,178,009	727,270	135,254	46,723	31,618	22,269	10,317	7,804	2,900	783	300	70	6	0
20SB_B09	Offshore Export Cable Route Corridor	95.0%	4,442,100	2,080,443	1,196,583	736,045	131,250	43,163	29,494	21,026	10,024	7,583	2,817	760	292	68	6	0
20SB_C03	Offshore Export Cable Route Corridor	89.5%	4,063,125	1,904,535	1,096,659	675,701	122,846	42,093	29,409	21,534	10,895	8,242	3,062	826	317	74	6	0
20SB_C07	Offshore Export Cable Route Corridor	93.9%	4,105,778	2,365,570	1,568,484	1,112,660	463,087	279,507	198,836	147,908	76,170	56,698	18,879	3,229	382	88	7	0
20SB_C11	Offshore Export Cable Route Corridor	80.1%	3,722,225	1,998,607	1,210,768	761,502	125,741	35,729	25,773	19,477	10,466	7,925	2,934	784	299	69	6	0
20SB_C15	Offshore Export Cable Route Corridor	83.2%	3,743,332	2,158,395	1,432,411	1,017,233	425,532	264,199	195,056	151,194	84,892	63,872	22,773	5,332	1,680	385	32	0
20SB_C19	Offshore Export Cable Route Corridor	83.6%	3,762,552	2,169,723	1,440,122	1,022,874	428,214	267,334	198,776	155,239	88,445	66,657	24,010	5,839	1,956	449	37	0
20SB_D03	Offshore Export Cable Route Corridor	70.1%	2,852,700	1,668,927	1,126,425	815,968	372,775	231,563	164,253	121,774	62,587	46,955	16,449	3,590	992	228	19	0
20SB_D07	Offshore Export Cable Route Corridor	71.0%	3,356,580	2,104,403	1,451,272	1,051,633	446,034	280,106	209,581	164,141	93,642	70,517	25,103	5,904	1,897	430	36	0
20SB_D11	Offshore Export Cable Route Corridor	89.0%	3,990,240	2,401,119	1,573,489	1,068,062	305,749	152,125	107,106	78,342	38,958	29,252	10,229	2,244	637	144	12	0
20SB_D15	Offshore Export Cable Route Corridor	85.2%	3,981,400	2,370,777	1,532,240	1,020,382	249,210	112,783	82,053	62,338	33,521	25,154	8,762	1,892	520	118	10	0

Table J-8. Project Maximum Suspended Sediment Concentrations for Ebb Conditions (With Time)

Sample	Project Element	Total Fines (%)	Time (seconds)															
			0	10	20	30	60	90	120	150	240	300	600	1,200	1,800	3,600	7,200	14,400
			Maximum Sediment Concentration (mg/L)															
20SB_03-04	Lease Area	45.3%	846,300	657,708	504,182	377,123	102,515	47,634	38,892	32,391	20,563	16,087	6,111	1,282	282	66	6	0
20SB_05-02	Lease Area	97.6%	1,899,300	1,628,146	1,380,932	1,154,967	582,951	379,926	279,867	198,185	80,453	66,407	29,759	8,265	2,909	699	60	0
20SB_05-08	Lease Area	96.0%	1,856,250	1,608,321	1,371,533	1,145,381	526,019	341,485	274,482	215,144	118,238	102,052	52,010	15,883	5,850	1,427	122	0
20SB_06-07	Lease Area	90.4%	1,840,179	1,547,314	1,267,750	1,000,881	270,768	109,647	95,452	82,782	58,453	50,558	26,095	8,325	3,260	795	68	0
20SB_06-09	Lease Area	91.3%	1,740,780	1,568,786	1,404,340	1,247,104	815,503	671,067	605,465	546,472	416,422	359,187	182,352	54,919	19,814	4,832	412	0
20SB_07-14	Lease Area	70.9%	1,590,300	1,362,307	1,139,648	922,271	301,272	152,651	132,198	113,058	78,205	70,305	41,312	14,469	5,727	1,448	125	0
20SB_11-08	Lease Area	96.3%	1,817,800	1,358,307	1,010,421	738,867	198,565	93,335	74,172	60,531	37,011	28,559	10,622	2,427	707	162	13	0
20SB_11-12	Lease Area	90.2%	1,545,670	1,123,670	839,768	636,434	272,697	175,734	137,466	111,415	67,893	52,416	20,620	6,260	2,730	617	51	0
20SB_A04	Offshore Export Cable Route Corridor	56.0%	2,755,705	2,331,782	1,955,800	1,620,607	806,617	575,429	490,625	422,570	289,072	235,602	102,838	28,605	10,251	2,483	214	0
20SB_A08	Offshore Export Cable Route Corridor	44.2%	2,162,700	1,748,011	1,380,662	1,053,581	261,406	100,949	85,076	72,365	48,501	39,690	17,746	5,355	2,142	519	45	0
20SB_A12	Offshore Export Cable Route Corridor	62.9%	3,059,445	2,466,084	1,940,489	1,472,536	339,314	113,662	94,977	80,035	52,698	43,125	19,281	5,818	2,327	564	48	0
20SB_A16	Offshore Export Cable Route Corridor	91.7%	4,260,913	3,123,433	2,293,716	1,663,641	451,791	205,333	150,269	111,990	57,037	44,001	16,375	3,551	874	207	18	0
20SB_A20	Offshore Export Cable Route Corridor	97.7%	4,396,800	3,187,950	2,306,438	1,637,261	351,199	119,907	88,000	65,814	34,040	26,562	10,599	2,993	1,170	278	24	0
20SB_B01	Offshore Export Cable Route Corridor	89.6%	4,139,100	3,008,367	2,183,766	1,557,745	354,423	133,051	98,822	74,995	40,094	31,286	12,484	3,525	1,379	327	28	0
20SB_B05	Offshore Export Cable Route Corridor	92.1%	4,354,180	3,169,923	2,306,250	1,650,534	389,985	151,706	110,299	81,531	41,018	32,006	12,771	3,606	1,410	334	28	0
20SB_B09	Offshore Export Cable Route Corridor	95.0%	4,442,100	3,228,005	2,342,615	1,670,449	378,442	140,148	102,889	76,981	39,854	31,098	12,409	3,504	1,370	325	28	0
20SB_C03	Offshore Export Cable Route Corridor	89.5%	4,063,125	2,955,067	2,146,988	1,533,498	354,209	136,673	102,592	78,842	43,318	33,801	13,487	3,809	1,489	353	30	0
20SB_C07	Offshore Export Cable Route Corridor	93.9%	4,105,778	3,204,942	2,539,453	2,028,984	1,032,891	691,487	524,248	407,228	225,916	172,957	61,406	10,927	1,313	307	26	0
20SB_C11	Offshore Export Cable Route Corridor	80.1%	3,722,225	2,707,769	1,960,294	1,388,631	280,460	88,391	67,953	53,627	31,043	24,174	9,544	2,654	1,028	240	20	0
20SB_C15	Offshore Export Cable Route Corridor	83.2%	3,743,332	2,924,255	2,319,144	1,854,968	949,126	653,615	514,280	416,276	251,785	194,841	74,073	18,045	5,778	1,350	114	0
20SB_C19	Offshore Export Cable Route Corridor	83.6%	3,762,552	2,939,604	2,331,629	1,865,254	955,108	661,371	524,087	427,412	262,324	203,337	78,097	19,762	6,726	1,571	132	0
20SB_D03	Offshore Export Cable Route Corridor	70.1%	2,852,700	2,261,110	1,823,737	1,487,952	831,454	572,875	433,066	335,274	185,628	143,238	53,502	12,151	3,411	797	67	0
20SB_D07	Offshore Export Cable Route Corridor	71.0%	3,356,580	2,993,332	2,650,945	2,328,028	1,463,764	1,184,040	1,062,268	955,494	717,382	608,039	292,239	83,272	28,693	6,968	595	0
20SB_D11	Offshore Export Cable Route Corridor	89.0%	3,990,240	3,415,385	2,874,191	2,364,398	1,003,386	643,053	542,873	456,041	298,450	252,227	119,077	31,647	9,631	2,339	200	0
20SB_D15	Offshore Export Cable Route Corridor	85.2%	3,981,400	3,372,226	2,798,844	2,258,847	817,839	476,749	415,890	362,878	256,800	216,893	102,002	26,684	7,866	1,910	163	0

J.5.2 Sediment Deposition Rates

Table J-9 and Table J-10 list the deposition thicknesses at locations perpendicular to the trench centerline for all stations under the maximum flood and ebb currents. Figure J-8 and Figure J-9 show the maximum predicted sediment deposition along a representative export cable within the Offshore Project Area. It is important to note that deposition does not occur at all locations simultaneously because of the speed of the jet plow. The sediment resuspended because of jet plow operations moves in the direction of the local ambient current and then eventually settles and deposits in a layer along the marine seabed. For the analytical sediment transport model, it was assumed that sediments finer than 0.25 mm (fine sand) would be mobilized in the water column and transported by the ambient currents, which would distribute sediments in each particle class uniformly over the marine seabed. All sediments coarser than 0.25 mm would redeposit in or immediately adjacent to the trench (and therefore, not be considered suspended).

The deposition thickness was highest in the vicinity of the jet plow because fine sand tends to deposit close to the trench centerline due to its higher settling rate. Most of the coarser fine sediments settled to the marine floor within 16 ft (5 m) of the trench, and deposition depths decreased rapidly. For example, 20SB_A20 had a fine sand content of 88 percent and the maximum observed deposition depth during flood tides was 28.35 in (72 cm) at the trench, but within 32 ft (10 m) of the trench, the deposition decreased to 0.48 in (1.22 cm).

About 3.3 ft (1 m) from the trench, the highest predicted deposition thicknesses was 35.87 in (91.1 cm) during flood tides and 128.89 in (327.39 cm) during ebb tides that occurred at 20SB_D15, which was dominated by fine sands. At 20SB_D15 during flood tides, the deposition thickness reduced to less than 0.4 in (less than 1 cm) within 82 ft (25 m) of the trench centerline. At 20SB_D15 during ebb tides, the deposition thickness reduced to less than 0.4 in (less than 1 cm) within 32.8 ft (10 m) of the trench centerline. For sediment sampling locations with lower velocities during ebb tide (e.g., 20SB_D11 and 20SB_D15), sediment was not able to travel long distances and resulted in thicker depositions near the trench. These depositions decreased rapidly away from the trench.

As discussed previously, the model did not evaluate secondary resuspension that could occur after initial deposition because this would not be caused by the jet plow. Secondary resuspension could result in the recently deposited sediment being transported further than estimated; however, it would be expected that as this resuspended sediment is dispersed over a wider area, the thickness of deposited sediments would decrease.

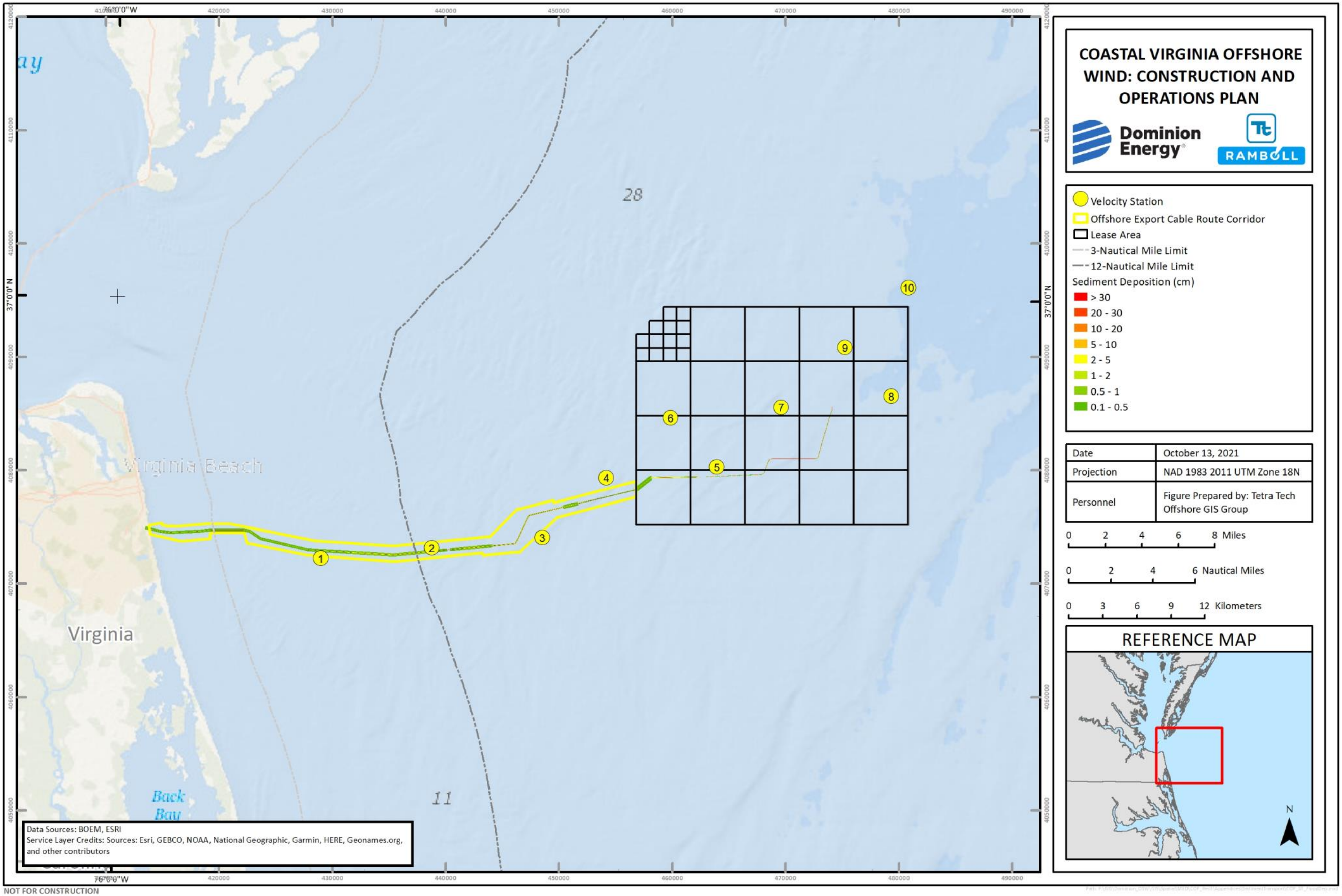

Figure J-8. Maximum Flood Tide Sediment Deposition Along Representative Offshore Export Cable Route

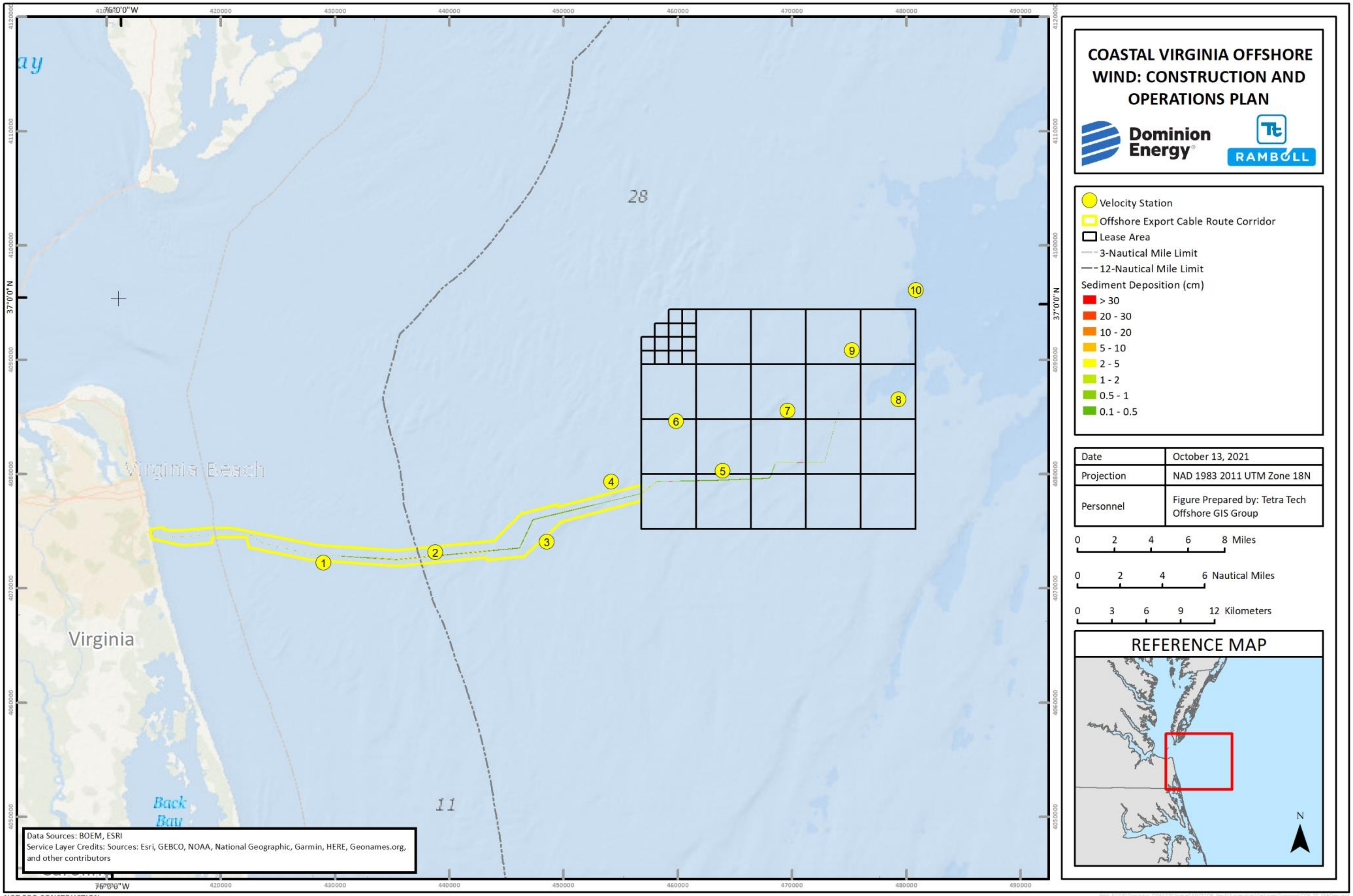

Figure J-9. **Maximum Ebb Tide Sediment Deposition Along Representative Offshore Export Cable Route**

Table J-9. Project Deposition Depths for Flood Conditions

Sample	Project Element	Total Fines (%)	Distance from Trench (m)															
			0	1	5	10	25	50	75	100	150	250	350	500	800	1,000	2,500	5,000
			Maximum Sediment Deposition (cm)															
20SB_03-04	Lease Area	45.3%	12.99	12.99	12.99	0.07	0.07	0.03	0.03	0.03	0.03	0.00	0.00	0.00	0.00	0.00	0.00	0.00
20SB_05-02	Lease Area	97.6%	23.17	23.17	23.17	4.04	4.04	0.06	0.06	0.06	0.06	0.00	0.00	0.00	0.00	0.00	0.00	0.00
20SB_05-08	Lease Area	96.0%	28.85	28.85	28.85	2.69	0.06	0.06	0.06	0.06	0.06	0.00	0.00	0.00	0.00	0.00	0.00	0.00
20SB_06-07	Lease Area	90.4%	32.39	32.39	32.39	0.37	0.03	0.03	0.03	0.03	0.03	0.00	0.00	0.00	0.00	0.00	0.00	0.00
20SB_06-09	Lease Area	91.3%	18.01	18.01	18.01	1.07	0.22	0.22	0.22	0.22	0.22	0.01	0.01	0.01	0.01	0.00	0.00	0.00
20SB_07-14	Lease Area	70.9%	27.99	27.99	27.99	0.73	0.03	0.03	0.03	0.03	0.03	0.00	0.00	0.00	0.00	0.00	0.00	0.00
20SB_11-08	Lease Area	96.3%	36.00	36.00	36.00	0.23	0.09	0.09	0.09	0.09	0.09	0.00	0.00	0.00	0.00	0.00	0.00	0.00
20SB_11-12	Lease Area	90.2%	21.93	21.93	21.93	0.25	0.10	0.10	0.10	0.10	0.10	0.01	0.01	0.01	0.01	0.00	0.00	0.00
20SB_A04	Offshore Export Cable Route Corridor	56.0%	26.95	26.95	26.95	0.71	0.71	0.19	0.19	0.19	0.19	0.01	0.01	0.01	0.01	0.01	0.00	0.00
20SB_A08	Offshore Export Cable Route Corridor	44.2%	30.25	30.25	30.25	0.19	0.19	0.03	0.03	0.03	0.03	0.00	0.00	0.00	0.00	0.00	0.00	0.00
20SB_A12	Offshore Export Cable Route Corridor	62.9%	43.77	43.77	43.77	0.27	0.27	0.03	0.03	0.03	0.03	0.00	0.00	0.00	0.00	0.00	0.00	0.00
20SB_A16	Offshore Export Cable Route Corridor	91.7%	62.38	62.38	62.38	2.05	2.05	0.13	0.13	0.13	0.13	0.00	0.00	0.00	0.00	0.00	0.00	0.00
20SB_A20	Offshore Export Cable Route Corridor	97.7%	71.51	71.51	71.51	1.22	1.22	0.05	0.05	0.05	0.05	0.00	0.00	0.00	0.00	0.00	0.00	0.00
20SB_B01	Offshore Export Cable Route Corridor	89.6%	64.53	64.53	64.53	1.16	1.16	0.06	0.06	0.06	0.06	0.00	0.00	0.00	0.00	0.00	0.00	0.00
20SB_B05	Offshore Export Cable Route Corridor	92.1%	65.62	65.62	65.62	1.61	1.61	0.06	0.06	0.06	0.06	0.00	0.00	0.00	0.00	0.00	0.00	0.00
20SB_B09	Offshore Export Cable Route Corridor	95.0%	68.53	68.53	68.53	1.37	1.37	0.06	0.06	0.06	0.06	0.00	0.00	0.00	0.00	0.00	0.00	0.00
20SB_C03	Offshore Export Cable Route Corridor	89.5%	64.23	64.23	64.23	1.06	1.06	0.06	0.06	0.06	0.06	0.00	0.00	0.00	0.00	0.00	0.00	0.00
20SB_C07	Offshore Export Cable Route Corridor	93.9%	50.32	50.32	50.32	6.25	0.82	0.82	0.82	0.82	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
20SB_C11	Offshore Export Cable Route Corridor	80.1%	78.70	78.70	78.70	0.61	0.06	0.06	0.06	0.06	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
20SB_C15	Offshore Export Cable Route Corridor	83.2%	44.09	44.09	44.09	2.36	0.63	0.63	0.63	0.63	0.02	0.02	0.02	0.02	0.00	0.00	0.00	0.00
20SB_C19	Offshore Export Cable Route Corridor	83.6%	44.23	44.23	44.23	1.72	0.62	0.62	0.62	0.62	0.02	0.02	0.02	0.02	0.00	0.00	0.00	0.00
20SB_D03	Offshore Export Cable Route Corridor	70.1%	30.60	30.60	30.60	5.93	0.57	0.57	0.57	0.57	0.01	0.01	0.01	0.01	0.00	0.00	0.00	0.00
20SB_D07	Offshore Export Cable Route Corridor	71.0%	47.48	47.48	1.84	1.84	0.63	0.63	0.63	0.63	0.02	0.02	0.02	0.02	0.00	0.00	0.00	0.00
20SB_D11	Offshore Export Cable Route Corridor	89.0%	88.32	88.32	4.40	4.40	0.31	0.31	0.31	0.31	0.01	0.01	0.01	0.01	0.00	0.00	0.00	0.00
20SB_D15	Offshore Export Cable Route Corridor	85.2%	91.10	91.10	1.85	1.85	0.26	0.26	0.26	0.26	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

Table J-10. Project Deposition Depths for Ebb Conditions

Sample	Project Element	Total Fines (%)	Distance from Trench (m)															
			0	1	5	10	25	50	75	100	150	250	350	500	800	1,000	2,500	5,000
			Maximum Sediment Deposition (cm)															
20SB_03-04	Lease Area	45.3%	52.50	52.50	0.25	0.25	0.25	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
20SB_05-02	Lease Area	97.6%	137.44	39.09	0.94	0.94	0.03	0.03	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
20SB_05-08	Lease Area	96.0%	176.41	1.84	1.84	0.07	0.07	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
20SB_06-07	Lease Area	90.4%	179.68	0.76	0.76	0.03	0.03	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
20SB_06-09	Lease Area	91.3%	109.25	6.55	6.55	0.22	0.22	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
20SB_07-14	Lease Area	70.9%	157.86	1.42	0.06	0.06	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
20SB_11-08	Lease Area	96.3%	97.83	97.83	0.36	0.36	0.36	0.01	0.01	0.01	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00
20SB_11-12	Lease Area	90.2%	47.49	47.49	0.64	0.27	0.27	0.27	0.03	0.03	0.03	0.03	0.00	0.00	0.00	0.00	0.00	0.00
20SB_A04	Offshore Export Cable Route Corridor	56.0%	140.29	7.27	2.76	2.76	0.10	0.10	0.10	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
20SB_A08	Offshore Export Cable Route Corridor	44.2%	154.19	1.84	0.39	0.39	0.02	0.02	0.02	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
20SB_A12	Offshore Export Cable Route Corridor	62.9%	223.05	2.55	0.42	0.42	0.02	0.02	0.02	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
20SB_A16	Offshore Export Cable Route Corridor	91.7%	187.77	187.77	8.03	0.59	0.59	0.01	0.01	0.01	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00
20SB_A20	Offshore Export Cable Route Corridor	97.7%	214.16	214.16	4.76	0.23	0.23	0.01	0.01	0.01	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00
20SB_B01	Offshore Export Cable Route Corridor	89.6%	193.34	193.34	4.52	0.26	0.26	0.01	0.01	0.01	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00
20SB_B05	Offshore Export Cable Route Corridor	92.1%	196.95	196.95	6.25	0.26	0.26	0.01	0.01	0.01	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00
20SB_B09	Offshore Export Cable Route Corridor	95.0%	205.42	205.42	5.33	0.26	0.26	0.01	0.01	0.01	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00
20SB_C03	Offshore Export Cable Route Corridor	89.5%	192.34	192.34	4.15	0.29	0.29	0.01	0.01	0.01	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00
20SB_C07	Offshore Export Cable Route Corridor	93.9%	119.62	119.62	18.51	2.82	2.82	0.01	0.01	0.01	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00
20SB_C11	Offshore Export Cable Route Corridor	80.1%	180.98	180.98	1.80	0.20	0.20	0.01	0.01	0.01	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00
20SB_C15	Offshore Export Cable Route Corridor	83.2%	102.90	102.90	7.16	2.17	2.17	0.06	0.06	0.06	0.06	0.00	0.00	0.00	0.00	0.00	0.00	0.00
20SB_C19	Offshore Export Cable Route Corridor	83.6%	102.84	102.84	5.30	2.12	2.12	0.07	0.07	0.07	0.07	0.00	0.00	0.00	0.00	0.00	0.00	0.00
20SB_D03	Offshore Export Cable Route Corridor	70.1%	74.04	74.04	17.45	1.96	1.96	0.04	0.04	0.04	0.04	0.00	0.00	0.00	0.00	0.00	0.00	0.00
20SB_D07	Offshore Export Cable Route Corridor	71.0%	177.54	9.39	9.39	0.28	0.28	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
20SB_D11	Offshore Export Cable Route Corridor	89.0%	326.76	4.59	4.59	0.10	0.10	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
20SB_D15	Offshore Export Cable Route Corridor	85.2%	327.39	3.87	3.87	0.08	0.08	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

J.6 CONCLUSIONS

Tetra Tech performed an analytical sediment transport study to conservatively evaluate the potential suspended sediment transport and deposition characteristics of installation of the Project's Offshore Export and Inter-Array Cables. The modeling was conducted using existing available data and a PDE approach to evaluate the effects of proposed submarine cable burial activities in terms of suspended sediment concentrations in the water column and sediment deposition characteristics such as deposition depth and deposited sediment footprint, so that an assessment of potential Project effects on surrounding water quality and habitats could be made. The conservative model assumed maximum trench dimension parameters and that all fine sediment (fine sand and smaller grain size sediment) disturbed by the jet plow during cable burial would be suspended in the water column; however, jet plow operations, including the angle of the plow blade and water pressure through the jet nozzles, can be adjusted during cable installation and could result in less sediment mobilizing in the water column.

The analytical sediment transport model yielded the following general conclusions:

- The suspended sediment concentration, deposition depth, and area of influence is dependent upon flood and ebb current velocities, burial depth, and the percentage of fine sediments in the sediment sample;
- The silt and clay sediment particles remain in suspension for about 4 hours after being mobilized in the water column. Coarser particles (fine sand) settle at a faster rate—about 1 minute after being mobilized; and
- For peak flood and ebb tides:
    - The initial maximum concentration at the release point is dependent on the percentage of fine particles (defined as particles in the fine sand class and smaller). At stations that are 80 percent fine particles, maximum concentrations at the trench line are approximately 4.44×10^6 mg/L for a trench depth of 18 ft (5.5 m). This instantaneous concentration is conservatively high and assumes that all particles finer than fine sand are instantly mobilized in the water column and remain in suspension until they settle;
    - The suspended sediment concentrations diminish rapidly away from the release point, and at most stations, over 85 percent of the suspended particles deposit within 16.4 ft (5 m) of the trench centerline. The typical concentration at 328 ft (100 m) is about 2,400 mg/L above background concentration for flood tides and about 290 mg/L above background concentration for ebb tides;
    - The suspended sediment concentrations drop rapidly with time. At most locations, the concentration drops by 75 percent or greater within 4 minutes of jet plowing activity. The maximum concentration at 4 minutes is 7.17×10^5 mg/L for ebb tide and 9.3×10^4 mg/L for flood tide. Average concentration at 4 minutes is 1.5×10^5 mg/L for ebb tide and 2.7×10^4 mg/L for flood tide;
    - The plume suspended sediment concentrations are higher for locations with higher proportions of very fine sediment contents, defined as sediments in the silt and clay classes;

- The deposition thicknesses were predicted to be greatest closest to the centerline trench. The maximum expected sediment deposition thickness under simulated conditions is 128.89 in (327.39 cm) at the trench centerline;
- The model indicated that most sediment deposited within or just outside the trench, specifically during ebb tide; and
- Deposition thicknesses were predicted to decrease rapidly away from the trench. Average deposition thicknesses were less than 0.4 in (1 cm) within 82.0 ft (25 m) of the trench centerline for flood tides and less than 0.4 in (1 cm) within 32.8 ft (10 m) of the trench centerline for ebb tides. Deposition thicknesses were less than 0.004 in (0.01 cm) at all stations within 8,202 ft (2,500 m) of the trench centerline.

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